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## [12] PATENT SPECIFICATION

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[54] Title: Medicated Tooth-Cleaning Chewing Gum

[57] Abstract: This invention relates to a medicated tooth-cleaning chewing gum. The inventive product is made using extracted, refined Chinese herbs magnolia, Chinese violet, safflower, honeysuckle and lilac, organic acid together with carbonate or bicarbonate are used as effervescent agents and a surfactant is used as a foaming agent. The inventive product is used in various ways. It can be chewed or left in the mouth until it dissolves. Experiments show that the inventive product has remarkable anticaries, bactericidal and tooth-cleaning action. It is suitable for children to use as a substitute for tooth brushing. It can also be used by adults in circumstances where it is not convenient to brush the teeth. It has the action of dental care and cleaning and treating oral disease and is safe to use.

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## Claims

1. A medicated tooth-cleaning chewing gum and its manufacturing process, characterized by using Chinese herbal extract as the main ingredients, organic acid plus carbonate or bicarbonate as effervescent agents, a surfactant is used as a foaming agent, and an appropriate amount of flavorings in the following recipe: 0.1-5 wt parts of Chinese herb extracts, 10-30 wt parts of organic acid, 10-30 parts of carbonate or bicarbonate, said Chinese herbal extract comprising magnolia, Chinese violet, safflower, honeysuckle and lilac in weight proportions of 3-5 parts magnolia, 1-3 parts Chinese violet, 1-3 parts safflower, 1-3 parts honeysuckle and 1-3 parts lilac.

2. A medicated tooth-cleaning chewing gum in accordance with Claim 1, characterized by a manufacturing process comprising the following steps:

Step 1: Magnolia, Chinese violet, safflower, honeysuckle and lilac are compounded according to the recipe; water is added to steep and decoct to obtain an aqueous extract, ethanol is added to the solution to precipitate the impurities; the product is then filtered and left to dry to obtain the extract, which is ground to a powder;

Step 2: Carbonate or bicarbonate is blended with the medicinal powder and the mixture is ground; starch milk is added and the product is granulated; organic acid is added and ground together with the medicinal powder; starch milk is added and this product is granulated; the two kinds of granules are separately oven-dried and granulated; appropriate amounts of effervescent agent, flavorings and other additives are weighed out, pulverized and added to the two kinds of granules, which are then blended to homogeneity.

Step 3: The product is extruded to shape, ground to powder, or added to dentifrice or chewing gum base to obtain a product of another form, and the product is then wrapped with plastic and packaged.

## Specification

### MEDICATED TOOTH-CLEANING CHEWING GUM

This invention relates to an oral hygiene product for cleaning the teeth, ie, Tooth Cleaner (*Kouchijing*) and to its manufacturing process.

Conventionally toothpaste and the toothbrush are used to clean the teeth. In order to achieve a medicinal action at the time of tooth brushing, some medicated toothpastes have been invented, such as *Sarcandra glabra*-containing toothpaste (*Caoshanhu yagao*), *Zanthoxylum nitidum* DC-containing toothpaste (*Liangmianzhen yagao*) and stomach-invigorating toothpaste (*Weikang yagao*). To remedy the drawbacks of toothpaste, some solid dentifrices are used as oral hygiene products. The mechanical action of tooth-brushing with toothpaste or tooth powder removes dirt and kills bacteria in the mouth, thus achieving the purpose of cleaning and protecting the teeth, and removing foreign odors in the mouth. However, tooth brushing is not suitable for children and persons prone to gingival bleeding, because tooth brushing damages the teeth and gums. Sometimes tooth brushing can be inconvenient for elderly persons who have difficulty walking, for bedridden patients and for travelers. Thus it is vital to provide a convenient, quick and effective tooth-cleaning method by integrating the tooth-cleaning action of toothpaste, the mechanical function of the toothbrush and the health-promoting and care action of medications.

The purpose of this invention is to propose a novel oral hygienic product called Tooth Cleaner, which is convenient to use and has ideal action. The product quickly takes effect after use and has anticaries, bactericidal, anti-inflammatory and mouth-deodorant action. Meanwhile the bubbles developed during gum-chewing mechanically remove foreign matter and dirt from the mouth to

achieve an oral cleaning action. This inventive product contains a specially made Chinese herbal extract as its main ingredient, organic acid plus carbonate or bicarbonate as the effervescent agent, and an appropriate amount of additives such as flavorings. The product can be ground to powder or extruded to sticks, can be added to a dentifrice or chewing gum base, or can be processed to obtain the inventive product called "Tooth Cleaner."

The weight ratio of its components are as follows: 0.1-5 parts Chinese herbal extracts, 10-30 parts organic acid and 10-30 parts carbonate or bicarbonate.

The specially made Chinese herbal extract used in the invention is manufactured according to traditional Chinese medicine theory as well as modern pharmacological and pharmaceutical theories. It contains as its components magnolia, Chinese violet, safflower, honeysuckle and lilac, which have synergistic anticaries, bactericidal, anti-inflammatory, cleansing and deodorant, refreshing-cooling and saliva-stimulant action. When the Chinese herbs are in the dry state, they are present in the following weight ratio: 3-5 parts magnolia, 1-3 parts Chinese violet, 1-3 parts safflower, 1-3 parts honeysuckle and 1-3 parts lilac. These herbs are extracted to obtain the Chinese herbal extract.

The effervescent agent used in this invention consists of organic acids such as citric acid, malic acid, fumaric acid, etc, mixed with carbonate or bicarbonate.

The flavorings used are menthol, sweeteners, etc.

The manufacturing process of this inventive product is as follows:

Step 1: 3-5 parts magnolia, 1-3 parts Chinese violet, 1-3 parts safflower, 1-3 parts honeysuckle and 1-3 parts lilac are weighed out and water is added to steep and decoct, ethanol is added to the water extract to precipitate the impurities, and the product is then filtered and left to dry to obtain the dry extract, which is then ground to a medicinal powder.

Step 2: Carbonate or bicarbonate is blended with the medicinal powder and the mixture is ground; starch milk is added and the product is granulated; organic acid is incorporated and ground together with the medicinal powder; starch milk is added to the mixture and the resulting product is granulated; the two kinds of granules are separately oven-dried and granulated; appropriate amounts of effervescent agent, flavorings and other additives are weighed out, pulverized and added to the two kinds of granules, which are then blended to homogeneity.

Step 3: The product is extruded to shape, with specially shaped sticks being preferred. The product can also be added to dentifrice or chewing gum base, or transformed to other forms, and the product is then wrapped with plastic and packaged.

The inventive product "Tooth Cleaner" can be chewed or left in the mouth for 30 seconds to 1 minute before being ejected from the mouth. It disintegrates quickly and spreads evenly in the mouth, generating abundant tiny bubbles. The inventive product has not only medicinal action, ie, tooth-cleaning, but also the mechanical function of removing dirt from the tooth surface and food residues from the dental interstices. The product is easy to carry and use, has quick and sustained action, and a good mouthfeel. It is particularly suitable for travelers and for circumstances where brushing is not convenient, such as after a meal at work. By using this product, children and those who are prone to bleeding gums avoid the damage to their teeth and gums caused by brushing. Moreover, this product can be used together with tooth brushing. Thus it is a novel oral hygiene product with a promising future.

#### **Embodiment 1:**

5 g of magnolia, 1 g of Chinese violet, 1 g of safflower, 1 g of honeysuckle and 1 g of lilac are weighed out. 50 mL of water is added and the herbs are decocted for 2 hours, then concentrated. Ethanol is added to the concentrated solution to precipitate the impurities. The product is filtered and the filtrate is evaporated and dried to obtain a dry extract. The dry extract is then ground to obtain a powdered medicine. The extraction rate is 10 to 15%.

To prepare 100 sticks of the product, 19.06 g of sodium bicarbonate and 0.3 g of powdered medicine are ground and mixed together. Starch milk is then added and the mixture is granulated. 15.6 g of citric acid and 0.2 g of the powdered medicine are ground and mixed together. Starch milk is then added and the mixture is granulated. Both kinds of granules produced are separately oven-dried at a temperature of 70 °C or lower and granulated. 1.5g of sodium lauryl sulfate, 0.4g of menthol, 0.5 g of talcum powder, 0.3 g of saccharin, 0.1 g of magnesium stearate are weighed out and ground. The product is mixed evenly with both kinds of granulated products and extruded into sticks weighing 0.3 g each, wrapped in plastic and packaged.

**Embodiment 2:**

5 g of magnolia, 1g of Chinese violet, 1 g of safflower, 1 g of honeysuckle and 1 g of lilac are weighed out. 50 mL of water is added to these herbs. The solution is decocted for 2 hours and concentrated. Ethanol is added to the solution to precipitate the impurities. The product is filtered and the filtrate is evaporated to dryness, yielding the dry extract, which is then ground to medicinal powder. The extraction rate is 10 to 15%.

To prepare 100 sticks of the product, 19.06 g of sodium bicarbonate are ground and sieved with a 60 mesh sieve. 15.6 g of citric acid is ground and sieved with a 60 mesh sieve. 0.5g of the medicinal powder is sieved with a 60 mesh sieve. 1.5g of sodium lauryl sulfate, 0.4 g of menthol, 0.5 g of talcum powder, 0.3 g of saccharin, 0.1 g of magnesium stearate are weighed out and ground. The product is mixed to homogeneity with the above mentioned 3 components. The mixture is then extruded to sticks weighing 0.3 g each, wrapped with plastic and packaged.

**Embodiment 3:**

**Tests of the Inventive Tooth Cleaner for Bacteriostasis**

Protein and agar medium are used to make a solid plate. The plate is sterilized and inoculated with mouth rinsing from a subject who has used the Tooth Cleaner. The mouth rinsing from the person who has not used Tooth Cleaner is used as the control. The plate is then put into the incubator at 37 °C constant temperature for 24 hours. The control plate is full of colonies, while on the plate with the mouth rinsing from the subject who has used Tooth Cleaner, there are only 2 or 3 scattered colonies and the growth of colonies is poor. This significant difference shows that the inventive product has remarkable medicinal action.